

ART 34 AMDT

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Claims

1. A process for the production of charged polyurethanes comprising reacting isocyanat groups of a polyisocyanate with hydroxyl groups of different alcohols comprising

(i) a first alcohol selected from one or more diols containing at least 10 carbon atoms;

(ii) a second alcohol selected from alkylene diols having not more than 8 carbon atoms, alkyleneoxy diols having not more than 8 carbon atoms, polyols with at least three hydroxyl groups, and mixtures thereof;

(iii) a third alcohol selected from (a) diols containing a charged group or atom, (b) diols containing an uncharged group or atom capable of charge formation and at least partially converting the uncharged group or atom into a charged group or atom, (c) polyols and further reaction of one or more hydroxyl group derived from the polyol with a compound containing a charged group or atom or a compound containing an uncharged group or atom capable of charge formation and at least partially converting said uncharged group or atom into a charged group or atom, and mixtures thereof.

2. A process for the production of charged polyurethanes according to claim 1, characterised in that the second alcohol is selected from polyols containing from 3 to 10 carbon atoms.

3. A process for the production of charged polyurethanes according to claim 1 or 2, characterised in that in the production of anionic polyurethanes, the first alcohol is an aliphatic diol having an aliphatic side-chain substituent having at least 10 carbon atoms.

4. A process for the production of charged polyurethanes according to claim 1, 2 or 3, characterised in that the polyurethane is anionic.

5. A process for the production of charged polyurethanes according to claim 1, 2 or 3, characterised in that the polyurethane is cationic.

6. A process for the production of charged polyurethanes according to claim 1, 2 or 3, characterised in that the polyurethane is amphoteric.

7. A process according to any of the preceding claims, characterised in that the third alcohol is selected from (a) diols containing a charged group or atom, (b) diols containing an uncharged group or atom capable of charge formation, and mixtures thereof.

8. A process according to any of the preceding claims, characterised in that the first and second alcohols are introduced into the process for reaction before introducing the third alcohol.

9. A process according to any of the preceding claims, characterised in that (i) the first alcohol is an aliphatic diol having an aliphatic substituent with at least 10

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carbon atoms; (ii) the second alcohol is selected from diols, triols, tetraols, and mixtures thereof; and (ii) the third alcohol is selected from N-alkandiol dialkylamines, acid addition salts thereof and quaternization products thereof, N-alkyl dialkanolamines, acid addition salts thereof and quaternization products thereof, diols containing a carboxylic acid group, diols containing a carboxylate group, diols containing a sulfonic acid group, diols containing a sulfonate group, and mixtures thereof.

10. A process according to any of the preceding claims, characterised in that the process is carried out using from 10 to 60 mole% of (I) hydroxyl groups of the first alcohol, from 3 to 50 mole% of (II) hydroxyl groups of the second alcohol and from 25 to 60 mole% of (III) hydroxyl groups of the third alcohol, the sum of percentages of (I) + (II) + (III) being 100.

11. Charged polyurethane obtainable by a process according to any one of claims 1 to 10.

12. Aqueous dispersion containing a charged polyurethane according to claim
15 11 or containing a charged polyurethane produced according to any of claims 1 to 10.

13. A method of surface-treating a material in sheet or web form by applying a composition to the surface of the material, characterised in that the composition comprises a charged polyurethane according to claim 11 or an aqueous dispersion containing a charged polyurethane according to claim 12.

14. A method according to claim 13, characterised in that the material in sheet or web form is a cellulosic product.

15. A method according to claim 13 or 14, characterised in that it is a surface sizing method which is carried out using an aqueous sizing composition.

16. A method according to claim 13 or 14, characterised in that it is a
25 paper coating method which is carried out using an aqueous pigmented composition.